



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/040,957	01/02/2002	Daeyoul Yoon	IGARA31.001AUS	5160
22850	7590	03/29/2004	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			GEISEL, KARA E	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/040,957

Applicant(s)

YOON ET AL.

Examiner

Kara E Geisel

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7 and 11-13 is/are rejected.
- 7) ☒ Claim(s) 6 and 8-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 0402.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Art Unit: 2877

DETAILED ACTION

Preliminary Amendment

The preliminary amendment filed on May 7th, 2002, has been entered into this application.

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

The certified copy has been filed in this application on January 2nd, 2002.

Information Disclosure Statement

The information disclosure statement filed on April 2nd, 2002 has been fully considered by the examiner.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 4-5 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4 and 5 recite the limitation "said light multiplex reflector" in lines 2 and 3, respectively. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "said collimate lens" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at

Art Unit: 2877

the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 7, and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki (USPN 5,930,045), as cited by applicant, in view of Dahne et al. (USPN 4,746,179).

In regards to claim 1, Shirasaki discloses a variable group delay unit (fig. 13) comprising an input/output waveguide element (fig. 13, 246), for introducing and deriving light, a light-reflecting element (fig. 13, 254) arranged with a spacing to said input/output waveguide element to reflect light, a multiple reflecting device (fig. 13, 240) provided on an optical path in which a light introduced by said input/output waveguide element reflects upon the light reflecting element and returns to the input/output waveguide element, a first lens (fig. 13, 248 or 250) provided on the optical path between the multiple reflecting device and the input/output element, and a second lens (fig. 13, 252) provided on the optical path between the multiple reflecting device and light reflecting element, whereby the multiple reflecting device has a first interface (fig. 11, 124) facing to the first lens and a second interface (fig. 11, 122) as a surface opposite thereto that are parallel with each other to multiple-reflect a light incident on the multiple reflecting device by the first and second interface (fig. 11). The multiple reflecting device does not have a third interface having a slant surface at an angle from 90-180 degrees to the first interface. However, it is well known in the art to have a third interface at an angle to couple light into a multiple reflecting element

Art Unit: 2877

to allow for different placements of the input/output element, and it would be obvious to one of ordinary skill in the art to do this.

For example, Dahne discloses a multiple reflecting device (fig. 1) comprising a first interface (fig. 1, 21a) and a second interface (fig. 1, 21b) as a surface opposite thereto that are parallel with each other to multiple-reflect a light incident on the multiple reflecting device by the first and second interface (column 3, lines 24-53). The multiple reflecting device further includes a third interface having a slant surface at an angle of from 90-180 degrees to the first interface (fig. 1, 23). This is done in order to direct light from outside the multiple reflecting device, into the multiple reflecting device. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a third interface to Shirasaki's multiple reflecting device in order to allow for more versatility of placement of the input/output element in the device.

In regards to claim 2, the light introduced into the combined system by the input/output waveguide element would be incident on the third interface (Dahne fig. 1, 23) of the multiple reflecting device, and exited at the second interface (Shirasaki fig. 13, 244), a light reflected by the light reflecting element being incident on the second interface and exited at the third interface.

In regards to claim 3, the combined system has an angle ranging from 150-175 defined between the first and third interface (Dahne column 6, lines 11-59).

In regards to claim 7, the input/output waveguide element can be any conventional fiber including a single or multi mode fiber.

In regards to claim 12, the combined system further comprises an optical part moving device provided to vary a distance between the second lens and light reflecting element and the multiple reflecting device (Shirasaki, fig. 19).

In regards to claim 13, the combined system further comprises an optical coupling device (Shirasaki fig. 22, 284) for optically coupling to an input/output waveguide element of the group delay

Art Unit: 2877

unit, a light introducing element (fig. 22, 286) for introducing light to the input/output waveguide, and a light deriving means (fig. 22, 288) for deriving an exit light from the input/output waveguide element.

Allowable Subject Matter

Claims 6 and 8-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 4-5 and 11 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As to claim 4, the prior art of record, taken alone or in combination, fails to disclose or render obvious a variable group delay unit wherein a light multiplex reflector has an anti-reflection coating for a light at a set wavelength band formed in a region to pass light, in combination with the rest of the limitations of claim 4.

As to claim 5, the prior art of record, taken alone or in combination, fails to disclose or render obvious a variable group delay unit wherein a first and second interface of a light multiplex reflector are formed by working both surfaces of a substrate transparent at a wavelength band used, in combination with the rest of the limitations of claim 5.

As to claims 6 and 11, the prior art of record, taken alone or in combination, fails to disclose or render obvious a variable group delay unit wherein a first lens has an anamorphic lens to make a light traveling while reflecting within a multiple reflecting device such that a spot diameter in an interference direction thereof is smaller than a spot diameter in a direction orthogonal to the interference direction, in combination with the rest of the limitations of claims 6 and 11.

Art Unit: 2877

As to claim 8, the prior art of record, taken alone or in combination, fails to disclose or render obvious a variable group delay unit wherein a first and second lens have a anti-reflection coating for a set wavelength formed on a surface that light is to be incident, in combination with the rest of the limitations of claim 8.

As to claims 9 and 10, the prior art of record, taken alone or in combination, fails to disclose or render obvious a variable group delay unit wherein a light reflecting element is formed with a reflection film having a reflectance of 90% or more for a set wavelength band, in combination with the rest of the limitations of claims 9 and 10.

Additional Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art made of record is Martin et al. (USPN 3,810,040), Barbarossa et al. (USPN 6,392,807), and Cao (USPN 6,556,320).

Martin discloses an interface for coupling light into a multiple reflecting device comprising two parallel interfaces.

Barbarossa discloses a unit comprising an input/output waveguide element, a light reflecting element coupled to the input/output element, a multiple reflecting device with up to 6 interfaces, a first lens set between the input/output element and the multiple reflecting device, and a second lens between the light reflecting element and the multiple reflecting device.

Cao discloses a variable group delay unit comprising an input/output waveguide element for introducing and deriving light, a light-reflecting element arranged with a spacing to said input/output waveguide element to reflect light, a multiple reflecting device provided on an optical path in which a light introduced by said input/output waveguide element reflects upon the light reflecting element and returns to the input/output waveguide element, a first lens provided on the optical path between the multiple reflecting device and the input/output element, and a second lens provided on the optical path

Art Unit: 2877

between the multiple reflecting device and light reflecting element, whereby the multiple reflecting device has a first interface facing to the first lens and a second interface as a surface opposite thereto that are parallel with each other to multiple-reflect a light incident on the multiple reflecting device by the first and second interface.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kara E Geisel whose telephone number is **571 272 2416**. The examiner can normally be reached on Monday through Friday, 8am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on **571 272 2415**. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9306 for regular communications and 703 872 9306 for After Final communications. For inquiries of a general nature, the Customer Service fax number is 703 872 9317.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 1782.



Frank Font
Art Unit 2877

Frank G. Font
Supervisory Patent Examiner
Technology Center 2800

K.G.

KEG
March 16, 2004